UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
525 NE Oregon Street
PORTLAND, OREGON 97232-2737

Refer to:
2002/00404

July 19, 2002

Richard Yarde
United States Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208-3621

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation on the Effects of the Hartman's Riparian Restoration Project on the Umatilla River, Umatilla County, Oregon.

Dear Mr. Yarde:

Enclosed is a biological opinion (Opinion) prepared by the National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of the proposed riparian restoration project on the Umatilla River in Umatilla County, Oregon. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize Middle Columbia River (MCR) steelhead (*Onchorynchus mykiss*). As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are reasonable and appropriate to minimize the impact of incidental take associated with this action.

This Opinion also serves as consultation on essential fish habitat (EFH) for chinook salmon (*O. tshawytscha*) pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation Management Act (MSA) and implementing regulations at 50 CFR Part 600. An EFH analysis is required for chinook salmon (*O. tshawytscha*).

Please direct any questions regarding this consultation to Brett Farman of my staff in the Oregon Habitat Branch at 541.975.1835 ext. 228.

Sincerely,

Russell M Strach for

D. Robert Lohn
Regional Administrator

cc: Amy Sexton, CTUIR
Mary Headley, COE
Greg Smith, USFWS

Endangered Species Act - Section 7 Consultation
&
Magnuson-Stevens Act
Essential Fish Habitat Consultation

BIOLOGICAL OPINION

Hartman's Riparian Restoration Project,
Umatilla River, Umatilla River Basin,
Umatilla County, Oregon

Agency:	Bonneville Power Administration
Consultation Conducted By:	NOAA Fisheries, Northwest Region
Date Issued:	July 19, 2002
Issued by:	Russell M Strach for D. Robert Lohn Regional Administrator
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1. ENDANGERED SPECIES ACT

1.1 Background

On April 24, 2002, the National Marine Fisheries Service (NOAA Fisheries) received a letter, dated April 18, 2002, from the Bonneville Power Administration (BPA) requesting formal consultation on the potential effects of the proposed Hartman's Riparian Restoration project on the Umatilla River in Umatilla County, Oregon, on Middle Columbia River (MCR) steelhead (*Oncorhynchus mykiss*). The project will be implemented by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The letter and attached biological assessment (BA) described the proposed action, and concluded that the proposed action "may affect, and is likely to adversely affect" (LAA) MCR steelhead. Juvenile MCR steelhead are likely to be rearing in the project area in the Umatilla River during implementation of the riparian restoration project.

The MCR steelhead was listed as threatened under the Endangered Species Act (ESA) by NOAA Fisheries on March 25, 1999 (64 FR 14517). NOAA Fisheries applied protective regulations to MCR steelhead under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). The objective of this Opinion is to determine whether the subject action is likely to jeopardize the continued existence of MCR steelhead.

1.2 Proposed Action

The proposed action is to fund the restoration of a 950 foot section of the Umatilla River located at river mile (RM) 83 on Tom Hartman's property. The action is permitted by the Corps of Engineers (COE) under Section 404 of the Clean Water Act. The proposed restoration activities involve channel realignment, moving existing instream structures, placement of new instream structures, and revegetation of the riparian areas. The project is designed to address landowner concerns with bank erosion, protect and restore habitat for salmonids, and improve channel and floodplain function. The BPA has determined that the proposed project is LAA MCR steelhead. The entire project is expected to take nine full work days, and will be completed within the Oregon Department of Fish and Wildlife (ODFW) in-water work window of July 1st to August 15th.

The existing channel will be realigned in two locations by removing material from the one bank and depositing it onto the other. From the start of the reach, the first realignment (which moves material from the south to north bank) occurs between 300 and 600 feet downstream, and the second (which moves material from the north to south bank) occurs between 600 and 800 feet downstream. The total excavated material is estimated to be 700 yds^3. In both cases, the top layer of soil will be scalped back away from the stream and left at the top of the bank. The exposed gravel/cobble substrate will then be dug up with an excavator, which will be located in the stream channel, and transferred to the opposite side of the channel. To do this in a manner that will minimize disturbance, an onsite CTUIR fisheries biologist or technician will direct the excavator's position in the stream channel to effectively move materials from one side of the channel to the other with as little track movement as possible. When possible, the excavator will

transport material across the channel by simply swinging the excavator boom around to avoid any track movement. After the gravel/cobble substrate of the point bar has been constructed, the alluvial soils that had been initially pulled back will be placed on top of the newly constructed point bar to provide areas for growing vegetation to mimic a natural point bar. A Caterpillar may be used to spread the material during creation of the point bars, however, this equipment should spend minimal time in the stream except for having to cross the channel one time to access the point bar on the south bank.

Large woody material will be used to stabilize streambanks and pointbars and create protected microsites for riparian planting. A rootwad revetment will be created by installing three rootwads with footer logs on the north bank between 350 and 386 feet downstream from the upper end of the reach. A group of alder and locust trees currently exists between 250 and 350 feet downstream from the upper end of the reach, and these rootwad placement sites will extend this stabilized reach. Two large downed trees with attached rootwads that are currently laying across the channel will be moved from the middle of the reach, and utilized in their whole form to help stabilize the constructed pointbar just downstream from the rootwad revetment along the north bank. A whole tree logjam will be constructed at the beginning of the second pointbar along the south bank. These trees are intended to reduce flow velocity across the pointbars and increase sediment deposition along the bank and inside edge of the meander. A detailed description of the construction of these structures is found in the BA for this project.

During the ODFW in-water work window of July 1st to August 15th, flows will be low and the point bars will be dry. Because the logjam is being created on the dry point bar, this activity will have minimal sediment input into the river.

Two types of boulder structures will be used to improve vertical stability of the channel through the reach. Both structure types will utilize 30-inch to 48-inch diameter boulder material as a structural base, with smaller spoils of alluvial soils or gravel/cobble mixtures used for fill and bank armor. A low elevation bolder cross vane will be constructed 450 feet into the reach, and fully span the channel at the thalweg crossover location. This double row boulder structure will be keyed into each bank and will act to maintain channel elevation while providing some pool feature on the downstream side. The center of the cross vein will be level with the channel bottom to allow fish passage during any flow. Three J-vanes will be constructed on the north bank, beginning approximately 740 feet downstream from the start of the reach and ending at 850 feet. The J-vanes will be 35 feet in length and 52 feet apart. A detailed description of the construction of these structures is found in the BA for this project. These structures are designed to define the thalweg, maintain channel depth, and arrest erosion along the toe of the bank to stop undercutting, yet allow for overbank flow into the floodplain. Additional large rock material will be used for stabilizing large woody material that is placed throughout the project bringing the total estimated large boulder material required for this project to 335 yds^3. There will not be any large rock used for armoring or riprap along the bank. Large rock will only be used to create and stabilize the above described structures.

Planting in the form of native vegetation will be used for long-term bank stability of the site. Approximately 3,000-6,000 cuttings will be installed during implementation. A "stinger" mounted to the excavator will be used to interplant structures and banks disturbed by the construction activities. Plant cuttings and rooted stock will be planted in trenches created during rootwad revetment and vane construction to allow plant access to the water table exposed in this excavation. Additional large woody debris will be placed along banks and gravel bars in order to provide protected spots for planting. If the cuttings do not successfully establish themselves, a variety of bare root-stock plants will be planted. Species will be dependent on site access to harvest locations and availability of stock a week before implementation. The native species most typically planted include: Black cottonwood *(Populus trichocarpa*), red alder (*Alnus rubra*), red-osier dogwood (*Cornus sericea*), woodsy rose (*Rosa woodsii*), black hawthorn (*Crataegus douglasii*), western serviceberry (*Amelanchier alnifolia*), common chokecherry (*Prunus virginiana*), and various willow species (*Salix spp.*). Plant species will be determined based on specific planting sites.

After construction is completed, all disturbed areas will be seeded with native grasses. The amount planted will depend on the amount of area disturbed after implementation. The seed mix contains: 25% Sherman big bluegrass *(Poa ampla*), 25% Critania thickspike wheatgrass (*Agropyron dasystachyum*), 25% Whitmar beardless wheatgrass (*Agropyrun inerme*), and 25% Magnar basin wildrye (*Elymus cinereus*).

The construction contract will require the following routine spill prevention and remediation measures: (1) Machinery will be inspected prior to onsite use; (2) all fueling, lubrication, and construction equipment maintenance activities will be located greater than 300 feet from any water body or stream; (3) a 15-gallon capacity oil boom will be kept on site during the in channel work; (4) a spill prevention and remediation plan will be utilized as necessary; (5) the excavator is required to have a properly guarded belly pan for pioneering work in rough terrain; and (6) CTUIR representatives will be on-site to oversee heavy machinery in use.

Steelhead utilization will be determined by electroshocking surveys to be conducted in the project area prior to, and after implementation of the project. The intent of this monitoring is to determine whether the increase of riparian vegetation and large woody debris positively affects salmonid utilization. Although the CTUIR Natural Production Project has a research permit under section 10 of the ESA, the electroshocking surveys conducted for this project are considered as part of the action, and are therefore considered in this consultation.

To monitor the project after implementation, CTUIR fisheries staff will conduct site-specific effectiveness monitoring for 15 years following project completion. Photopoints will be taken once a year (typically in July) to monitor the establishment of vegetation. Native plants will be supplemented during spring and fall of each year, for a period of 1-3 years, depending on survival. Channel geomorphology will also be assessed before and after project implementation. Channel cross-sections used for the project design will be repeated after project implementation to monitor changes in the channel morphology.

1.3 Biological Information

The MCR steelhead evolutionarily significant unit (ESU) was listed as threatened under the ESA by NOAA Fisheries on March 25, 1999 (64 FR 14517). Biological information concerning the MCR steelhead is found in Busby *et al*. (1996). The current status of the MCR steelhead, based upon their risk of extinction, has not significantly improved since the species was listed. Within the Umatilla River basin, returns of adult wild summer steelhead have declined from highs of 2,816 and 3,296 (in 1986 and 1987) to an average of 963 during 1995 - 1997. Hatchery steelhead, developed from wild Umatilla broodstock, were introduced to the Umatilla River basin in the late1980s, and an increasing percentage of the summer steelhead are of hatchery origin; 17% of the total adult returns in 1990 vs. 62% in 1997 (Chilcote, 1998).

The Umatilla River provides spawning, rearing, and migratory habitat for both adult and juvenile life stages of MCR steelhead. Adult MCR steelhead enter the Columbia River beginning in the spring, and migrate upriver through the summer, fall, and winter, seeking their tributary of origin. By early the next spring the adults have reached their natal streams and spawn in gravel redds/nests from March through early June. Deposited eggs usually hatch by the end of July during the same year. The resulting juveniles will spend from one to four years rearing to smolt size at which time they will begin their migration to the ocean. Based on surveys of the area, high numbers of juvenile steelhead are expected to be rearing in the project area during all phases of this project (Contor *et al.* 1996 and 1998).

Essential features of the adult spawning, juvenile rearing, and adult and migratory habitat for this species are substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food (juvenile only), riparian vegetation, space, and safe passage conditions (Bjorn and Reiser 1991, NMFS 1996b, and Spence *et al* 1996). The essential features that the proposed project may affect are substrate, water quality, water temperature, water velocity, cover/shelter, food, riparian vegetation, and safe passage conditions.

1.4 Evaluating Proposed Action

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the continued existence of the listed species. This analysis involves the initial steps of defining the biological requirements and current status of the listed species; and evaluating the relevance of the environmental baseline to the species' current status. Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the continued existence of the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize, NOAA Fisheries must identify reasonable and prudent alternatives for the

action. For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action.

1.4.1 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed MCR steelhead is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list MCR steelhead for ESA protection and also considers new data available that is relevant to the determination.

The relevant biological requirements are those necessary for MCR steelhead to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment. For this consultation, the biological requirements are improved habitat characteristics that function to support successful adult and juvenile migration, spawning and rearing.

MCR steelhead survival in the wild depends on the proper functioning of certain ecosystem processes including habitat formation and maintenance. The restoration of improperly functioning habitat to a more properly functioning condition will likely lead to improved survival and recovery of MCR steelhead. In conducting analyses of habitat altering actions, NOAA Fisheries defines the biological requirements in terms of a concept called properly functioning condition (PFC), and applies a "habitat" approach to its analysis (NMFS 1999). The current status of MCR steelhead, based on their risk of extinction, has not improved much since the species was listed.

1.4.2 Environmental Baseline

The current range-wide status of the MCR steelhead is found in Busby *et al*. (1996). The identified action will occur within the range of MCR steelhead. The defined action area is the area that is directly and indirectly affected by the proposed action. The direct effects occur at the project site and may extend upstream or downstream based on the potential for impairing fish passage, stream hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed, where actions described in this Opinion lead to additional activities, or affect ecological functions, contributing to stream degradation. As such, the action area for the proposed activities include the immediate portions of the watershed containing the project, and those areas upstream and downstream that may reasonably be affected, temporarily or in the long term, by the proposed project.

The Umatilla River originates east of Pendleton, on the west slope of the Blue Mountains, and flows 115 miles in a northwesterly direction to the Columbia River entering at RM 289. The basin drains approximately 2,290 square miles. The mouth of the Umatilla River at Umatilla, Oregon is approximately 270 feet in elevation (above mean sea level). The headwaters are as high as 4,950 feet. Mean annual precipitation ranges from 10 inches/year at Umatilla to 50 inches/year in the headwaters (Taylor, 1993). Since 1855, aquatic and riparian habitats in the Umatilla Basin have been degraded through irrigation diversions, water extractions, channelization, livestock grazing, logging, agriculture and urban development (Nielson 1950, NPPC 1987).

The project stream reach consists of a full meander wavelength, although the existing channel planform is relatively straight. The project reach appears to be an overextended meander, and is significantly longer than meanders in adjacent reaches. The existing channel morphology shows signs of instability with a bankfull width that varies between 80 and 95 feet and a low sinuosity (channel length/valley length) of approximately 1.1. Decreased sinuosity usually translates to increased drainage efficiency, increased channel and bank erosion, and disconnection from the floodplain.

Channel instability and bank erosion is apparent along most of the length of the Umatilla River. Large flow events that exceed bank height often result in local scour of floodplain soils and mass wasting of streambanks. Floodplain developments combined with geologic control have limited the available space for lateral channel movement and access to floodplain. This results in a constrained reach within the vicinity of the project as well as the reach directly above the project. Land management activities have changed riparian vegetation composition and density, and have resulted in a situation that promotes downcutting and bank instability.

The channel from the Meacham Creek confluence to the headwaters was classified as a Rosgen "B-Type" channel, which is considered to be naturally constrained, during habitat surveys conducted by CTUIR. Constrained waterways have reduced off-channel habitat, which is a determinant of salmonid smolt production. The Upper Umatilla River is listed on the 1998 Oregon Department of Environmental Quality (ODEQ) list for habitat modification under section 303(d) of the Clean Water Act. The listing is based on comparison of in-field measurement of habitat elements (pool frequency, pool quality, pieces of wood per 100 meters, width/depth ratio) to the ODEQ benchmarks. Habitat surveys were conducted from RM 81.8 to the mouth of the North Fork of the Umatilla River (RM 89.6) in the summer of 1995 (Contor *et al*., 1995). These surveys were used to determine baseline condition for this biological assessment. The project site is located within this reach at RM 83.

Environmental baseline conditions within the action area were evaluated at the project level and watershed scale. The results of this evaluation are based on the "Matrix of Pathways and Indicators" (MPI) described in *Making Endangered Species Act Determinations of Effects for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). This method assesses the current conditions of instream, riparian, and watershed factors that collectively provide properly functioning aquatic habitat essential for the survival and recovery of the species.

During the summer habitat surveys of 1995, the highest water temperature recorded was 32ºC (89.6ºF) at Bingham Hot Springs near RM 86.6. The second highest water temperature recorded was 21ºC (70ºF) near RM 84.8, while the lowest was 10ºC (50ºF) near RM 85.6. Water temperature and habitat conditions are generally suitable for salmonids throughout this reach, excluding Bingham Hot Springs. Fast water habitat accounted for 60.3% of the wetted area surveyed, with an average depth of 0.27 m. Slow water habitat comprised 38.5% of the area, with an average maximum depth of 0.65 m. There are some backwater and high-energy side channels throughout this reach of the river. However, the abundance of this type of habitat has been greatly reduced as a result of channel confinement due to development in the floodplain.

The Umatilla River to the forks (confluence of North and South Forks of the Umatilla River at RM 89.5) are included on the 1998 ODEQ 303(d) list for sedimentation. The upper portion of the river is usually most affected by turbidity during high flow events.

The chemical constituents in the Umatilla River above the confluence of Meacham Creek are typically within the natural range of conditions. ODEQ identified aquatic weeds or algae as an impairment to mainstream water quality from the confluence of Wildhorse to the forks, which includes this upper river reach. Potential nutrient additions from rural areas may cause localized problems.

There are no known passage barriers within the upper reaches of the Umatilla River (CTUIR *et al*., 2001). However, there are some partial passage barriers lower in the system, such as Feed Canal Dam at RM 28.5.

Approximately 70% of riparian areas in the Umatilla River Basin were reported to be in need of improvement (ODFW, 1987). Extensive vegetation removal and disturbance associated with urban development, cultivation, forestry, transportation corridors, flood control, and irrigation has occurred and continues to occur in the subbasin.

The average width of the active channel is 2.0 times that of the wetted channel width. The average width to depth ratio of the wetted channel is 22.6:1. The width to depth ratio for riffles was 35.4:1. For Rosgen “B-Type” channels, a 12:1 ratio is considered moderate. As width/depth ratios increase, hydraulic stress and bank erosion increase (Rosgen 1996). Only 9% of the bank length had established undercutting, potentially valuable to fish, and 7% of the bank length was actively eroding.

In 30 out of 50 reaches surveyed by the Umatilla National Forest, ODFW and CTUIR, above the Meacham Creek confluence, substrate appeared to be a good quality component of spawning habitat by size (2-64mm) and embeddedness (16%) (CTUIR *et al*., 2001). Woody debris counts were low in the mainstem Umatilla River channel from headwaters to Meacham Creek and provided little fish habitat. Instream wood complexity ratings pertaining to fish habitat ranked very low. Habitat refugia exists, but is not adequately buffered by intact riparian reserves. Existing refugia is insufficient in size, number, and connectivity to maintain viable populations.

The Umatilla River has distinctive geomorphic characteristics. The BA states that the presence of shallow soils, trellis-like stream patterns, and geometry perpendicular to most storm patterns (which implies that large precipitation events collect water along the entire length rather than up or down the system), leads to assumption that flows have been historically flashy. Because of the loss in wetland habitat and the decreased connectivity with the floodplain resulting from channel manipulation, significant changes are expected in the hydrograph over time. Also, historical timber harvest in steep headwater portions of the basin has likely altered run off contribution by reducing water storage capacities.

There are approximately 2-3 miles of roads per square mile of area in the upper basin. A valley bottom road running parallel to the river significantly confines the upper portions of the basin. There has been a moderate increase in drainage network density resulting from roads.

Through much of the upper Umatilla subbasin, riparian vegetation is not a limiting factor. The mainstem Umatilla, between the forks to Meacham Creek receives moderate shade due to a mixture of deciduous trees and conifers, but tree density is low. In the upper portions of the basin, the primary problem is development in the floodplain causing channel confinement.

1.5 Analysis of Effects

1.5.1 Effects of Proposed Action

The purpose of the proposed action, as described in section 1.2 of this Opinion is to restore the current dysfunctional state of the stream channel and to prevent streambank erosion along a 950-foot reach of the Umatilla River. These objectives will be accomplished by re-routing the existing channel, placing rock and wood structures in the stream, and planting riparian vegetation.

The effects determination in this Opinion was made using a method for evaluating current aquatic conditions, the environmental baseline, and predicting effects of actions on them. This process is described in *Making Endangered Species Act determinations of effect for individual and grouped actions at the watershed scale* (NMFS 1996). The effects of the action are expressed in terms of the expected effect (restore, maintain, or degrade) on aquatic habitat factors in the action area. For the proposed actions, all habitat factors for the Umatilla River will be maintained in the long term. NOAA Fisheries does expect some negative effects in the short-term. Specific effects are discussed below.

Impacts of the proposed actions to stream habitat and fish populations can be separated into direct and indirect effects. Direct effects are those which contribute to the immediate loss or harm to individual fish or embryos (*e.g.*, directly stepping on or crushing a fish, trampling a redd that results in the actual destruction of embryos, or dislodging the embryos from the protective nest and ultimately destroying eggs).

Indirect effects are those impacts which occur at a later time, causing loss of specific habitat features (*e.g.*, undercut banks, sedimentation of spawning beds), localized reductions in habitat quality (*e.g.*, sedimentation, loss of riparian vegetation, changes in channel stability and structure), and ultimately cause loss or reductions of entire populations of fish, or widespread reductions in habitat quantity and/or quality.

To reduce sediment transport, instream work scheduled for this project will take place during the July 1st- August 15th ODFW in-water work window at which time, the Umatilla River has extremely low flows. The project is designed to reduce the long-term sediment transport from upland and riparian areas. Measures to minimize sediment movement include grass seeding of disturbed areas, planting unstable banks, and woody debris placement.

In the long term, many aspects of this project will improve instream habitat and facilitate the restoration of riparian vegetation. The instream structures can directly affect MCR steelhead by providing overhead cover for both adults and rearing juveniles. These structures will also create indirect effects by promoting pointbar stability, slowing the stream's hydraulic energy, helping prevent lateral migration, and providing shade, detritus, and terrestrial insect habitat. Complex pools will be created along the outside bends of the channel and will provide missing complexity in water depth, velocity, and habitat quality. Increased meandering will also reduce water velocity and allow for natural floodplain storage of water during high flow events. The riparian plantings planned for this project will improve fish habitat by improving bank stabilization, encouraging pool development, and providing terrestrial insect drop for fish. Increased shading by these plants should lead to a reduction of water temperatures.

Disturbance of riparian vegetation during implementation could result in increased sediment and decreased shade, leading to increased water temperatures until riparian vegetation is re-established (an indirect effect). To limit these risks, the BA identifies that the project activities will be implemented using standards prescribed by the Washington Department of Fish and Wildlife (WDFW) and the Washington Department of Natural Resources (WADNR). These standards include conducting work in dry weather, minimizing turbidity, avoiding disturbance of soil and vegetation, reseeding any scarred areas, and preventing petroleum products from entering the waterway. A CTUIR fish habitat biologist and/or technician will ensure that soil and vegetation are disturbed as little as possible to minimize negative impacts. For further protection of riparian vegetation, the landowner has signed a 15 year (13 years remaining) easement that does not allow grazing of animals within the riparian area. This is accomplished by keeping his horses in a corralled pasture away from the riparian area.

Installation of instream structures, streambank shaping, and new channel construction can directly affect MCR steelhead by creating a pulse of sediment. A temporary increase in sediment and turbidity could reduce light penetration and inhibit primary production, abrade and clog fish gills, prevent foraging of sight-feeding juvenile steelhead, and cause fish to avoid disturbed areas of the stream. Studies have shown that sediment inputs resulting in substrate embededness of greater than one third can result in a decrease in benthic invertebrate abundance, and thus decrease the amount of food available for juvenile salmonids (Waters 1995). Steelhead

are generally able to avoid the adverse conditions created by construction (turbidity, noise, and contaminants) if those conditions are limited to areas that are small or local compared to the total habitat area, and if the system can recover before the next disturbance. This means juvenile and adult steelhead will, to the maximum extent possible, readily move out of a construction area to obtain a more favorable position. The degree and effectiveness of the avoidance response varies with life stage, season and the frequency and duration of exposure to the unfavorable conditions, and the ability of the individual to balance other behavioral needs for feeding, growth, migration, and territory. Chronic or unavoidable exposure heightens physiological stress thus increasing maintenance energy demands (Redding *et al*. 1987, Servizi and Martens 1991). This reduces the feeding and growth rates of juveniles and can interfere with migration and growth to maturity. However, due to the short duration of construction activities, it is unlikely that the environmental changes could cause chronic or unavoidable exposure over a large habitat area sufficient to cause more than transitory direct effects to individual steelhead.

Increased sedimentation may indirectly affect MCR steelhead by increasing embeddness of spawning substrates downstream of the project. However, the amount of sediment generated from the proposed action should not occur in amounts sufficient to cause these adverse effects to MCR steelhead habitat.

Use of heavy equipment during construction creates the opportunity for direct injury or mortality through mechanical injury from equipment in the water. Operation of this equipment within the riparian are also creates the opportunity for accidental spills of fuel, lubricants, hydraulic fluid and similar contaminants into the riparian zone or water where they can directly affect aquatic organisms through injury or death. Petroleum contaminants in the water have the ability to impact growth, survival, and reproduction of juvenile salmon and trout, and can cause sublethal effects such as immune dysfunction. (Arkoosh et al. 1991)

The fish electroshocking survey operation can directly affect MCR steelhead through disturbance and stress. Stress approaching or exceeding the physiological tolerance limits of individual fish can impair reproductive success, growth, resistance to infectious diseases, and general survival (Wedemeyer *et al.* 1990). Mechanical injury is also possible during holding, netting, or electroshocking. Many factors influence the relative effects of electrofishing on fish including conductivity of water, depth of water, substrate, and size of the fish. Additionally, the amount of time taken to complete electrofishing within the sample area, the frequency of sampling through time, crew efficiency, and operator skill have been identified as factors influencing the magnitude of electrofishing effects.

1.5.2 Cumulative Effects

"Cumulative effects" are defined in 50 CFR 402.02 as those of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation." The action area for this consultation includes the streambed and streambank, including riparian areas, of the Umatilla River within the area of the project site and for a short distance upstream and downstream.

The BA identifies several land use practices that are causing negative impacts to streams and riparian areas in the Umatilla River subbasin. These include overgrazing, agricultural practices, and construction of valley bottom roads. NOAA Fisheries expects these activities to continue to occur at the current levels for the foreseeable future.

1.6 Conclusion

NOAA Fisheries has determined that, when the effects of the fish habitat restoration activities and actions associated with this project are added to the environmental baseline and the cumulative effects occurring in this area, they are not likely to jeopardize the continued existence of MCR steelhead. NOAA Fisheries believes that the proposed action will cause some minor, short-term increases in stream turbidity and sedimentation rates in the Umatilla River. It is also possible that some mortality of juvenile MCR steelhead may result from the instream work as well as the electrofishing survey operation. Vegetation removal is expected to result in a temporary decreased in shade, as well as some behavior modification in the form of avoidance of areas without sufficient cover. These effects will diminish over time as newly planted riparian vegetation is established. MCR steelhead are expected to avoid habitats affected in the short-term by negative construction effects until conditions improve. The project is expected to provide long-term benefits to MCR steelhead through habitat enhancement.

NOAA Fisheries' conclusions are based on the following considerations: (1) All instream work will occur during the ODFW in-water work window for this area (July 1st- August 15th), and instream work will be limited to the amount described in the BA; (2) all disturbed soils will be replanted with native vegetation; (3) fish electroshocking survey operations will be conducted by experienced CTUIR staff and will follow NOAA Fisheries electrofishing guidelines (Appendix A) to minimize stress and mortality to listed steelhead; (4) the landowner has signed a 15-year (13 years remaining) easement that will not allow grazing within the riparian area; (5) a 15-year comprehensive monitoring program will be conducted; (6) a net increase in fish habitat quality and quantity will result from the project activities. Thus, the proposed action is not expected to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

1.7 Conservation Recommendations

Section 7 (a)(1) of the ESA directs federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of proposed actions on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NOAA Fisheries has no additional conservation recommendations regarding the action addressed in this Opinion.

1.8 Reinitiation of Consultation

Reinitiation of consultation is required if: (1) The action is modified in a way that causes an effect on the listed species that was not previously considered in the BA and this Opinion; (2) new information or project monitoring reveals effects of the action that may affect the listed species in a way not previously considered; (3) the amount or extent of incidental take is exceeded; or (4) a new species is listed or critical habitat is designated that may be affect by the action (50 CFR 402.16).

2. INCIDENTAL TAKE STATEMENT

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

2.1 Amount or Extent of Take

NOAA Fisheries anticipates that the subject actions covered by this Opinion are reasonably certain to result in incidental take of juvenile MCR steelhead.

Some level of incidental take is expected to result from direct injury or death of juvenile MCR steelhead during instream work. The temporary increase in sediment and turbidity is expected to cause fish to avoid disturbed areas of the stream, both within and downstream of the project area. Effects from turbidity are expected to be of short duration, because turbidity levels will quickly return to preconstruction levels once instream work is completed. There is also potential for incidental take in the form of death or sub-lethal effects if toxicants are introduced into the water. Non-lethal take in the form of behavior modification (avoidance) is expected from riparian disturbance, vegetation removal, and decreased shade. This non-lethal take is expected to be reduced as newly planted riparian vegetation is established.

Because of the inherent biological characteristics of aquatic species such as MCR steelhead, the likelihood of discovering take attributable to this action is very limited. Take associated with the effects of actions such as these are largely unquantifiable in the short term, and may not be measurable as long-term effects on the species' habitat or population levels. Therefore, although NOAA Fisheries expects the habitat-related effects of these actions to cause some low level incidental take, the best scientific and commercial data available are not sufficient to enable NOAA Fisheries to estimate a specific amount of incidental take because of those habitat-related effects. In instances such as these, NOAA Fisheries designates the expected level of take as "unquantifiable".

In addition, incidental take in the form of capture and possible direct mortality is expected during the fish electroshocking survey operation. Project design precautionary measures, and the use of the NOAA Fisheries electrofishing guidelines (Appendix A), planned by the CTUIR for the fish survey operation should keep direct mortality to a minium. Based on rearing densities provided in the BA (up to 300+ fish/100m^2) within the project area (approximately 84m^2) and an electroshocking mortality rate of 3%, the expected level of juvenile MCR steelhead killed should not exceed eight individual fish. Therefore, if more than eight juvenile MCR steelhead are killed during the electroshocking surveys, the operation will halt and consultation must be reinitiated.

2.2 Effect of Take

In this Opinion, NOAA Fisheries has determined that the level of anticipated take is not likely to result in jeopardy to MCR steelhead when the reasonable and prudent measures are implemented.

2.3 Reasonable and Prudent Measures

NOAA Fisheries believes that the following reasonable and prudent measures are necessary and appropriate to minimize the likelihood of take of MCR steelhead resulting form the action covered in this Opinion. The BPA shall:

1. Minimize the likelihood of incidental take resulting from in-water work required to complete the project addressed in this Opinion.

2. Minimize the amount and extent of incidental take from construction activities in or near watercourses by ensuring that an effective spill prevention, containment, and control plan is developed, implemented, and maintained to avoid or minimize point-source pollution both into and within watercourses over the short term and the long term.

3. Minimize the likelihood of take resulting from riparian area disturbances including removal of vegetation and disturbance of soils and sediments.

4. Minimize the likelihood incidental take that may occur during the fish electroshocking survey operations.

5. Complete a comprehensive monitoring and reporting program to ensure implementation of conservation measures in this Opinion.

2.4 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the BPA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. To implement reasonable and prudent measure #1 (in-water work), the BPA shall ensure that:
   - a) Timing of in-water work. All instream work will be conducted during the ODFW in-water work window for the Umatilla River, July 1st- August 15th, and instream work will be limited to the actions described in the BA.
   - b) Preconstruction activity. Before significant[1] alteration of the project area, the following actions must be completed.
     - i. Marking. Flag the boundaries of clearing limits associated with site access and construction to prevent ground disturbance of critical riparian vegetation, wetlands and other sensitive sites beyond the flagged boundary.
     - ii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.
       - (1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[2]).
       - (2) An oil absorbing floating boom whenever surface water is present.
     - iii. Temporary erosion controls. All temporary erosion controls must be in-place and appropriately installed downslope of project activity within the riparian area until site restoration is complete.
     - iv. Temporary stream crossings.
       - (1) The number of temporary stream crossings must be minimized.
       - (2) Temporary road crossings must be designed as follows.
         - (a) A survey must identify and map any potential spawning habitat within 300-feet downstream of a proposed crossing.
         - (b) No stream crossing may occur at known or suspected spawning areas, or within 300-feet upstream of such areas if spawning areas may be affected.
         - (c) The crossing design must provide for foreseeable risks (*e.g.*, flooding and associated bedload and debris) to

[1] "Significant" means an effect can be meaningfully measured, detected or evaluated.

[2] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

prevent the diversion of streamflow out of the channel and down the road if the crossing fails.

(d) Vehicles and machinery must cross riparian areas and streams at right angles to the main channel wherever possible.

c) Cessation of work. Project operations will cease under high flow conditions that may result in inundation of the project area, except for efforts to avoid or minimize resource damage.

d) Fish passage. Passage will be provided for any adult or juvenile salmonid species present in the project area during construction, and after construction for the life of the project. Upstream passage is not required during construction if it did not previously exist.

2. To implement reasonable and prudent measure #2 (construction activities), the BPA shall ensure that:

a) Pollution and Erosion Control Plan. The contractor will develop and implement a site-specific spill prevention, containment, and control plan (SPCCP), and is responsible for containment and removal of any toxicants released. The contractor will be monitored by the BPA to ensure compliance with the SPCCP

i. Plan Contents. The Pollution and Erosion Control Plan must contain the pertinent elements listed below, and meet requirements of all applicable laws and regulations.

(1) Practices to prevent erosion and sedimentation associated with access roads, stream crossings, construction sites, borrow pit operations, haul roads, equipment and material storage sites, fueling operations and staging areas.

(2) A description of any hazardous products or materials that will be used for the project, including procedures for inventory, storage, handling, and monitoring.

(3) A spill containment and control plan with notification procedures, specific clean up and disposal instructions for different products, quick response containment and clean up measures that will be available on the site, proposed methods for disposal of spilled materials, and employee training for spill containment.

(4) Practices to prevent construction debris from dropping into any stream or water body, and to remove any material that does drop with a minimum disturbance to the streambed and water quality.

(5) Bridges, access roads, and work pads within 150 feet of the two-year floodplain will have containment measures in place that minimize any potential of petrochemical or hazardous materials from entering the two-year floodplain or stream channel.

(6) A fifteen gallon capacity oil boom will be kept on site during all instream work.

ii. Spill Event. Any hazardous material or petrochemical spill will be reported to NOAA Fisheries.
   (1) In the event of a hazardous materials or petrochemical spill, immediate action shall be taken to recover toxic materials from further impacting aquatic or riparian resources.
   (2) In the event of a hazardous materials or petrochemical spill, a detailed description of the quantity, type, source, reason for the spill, and actions taken to recover materials will be documented.

iii. Emergency erosion controls. Ensure that the following materials for emergency erosion control are onsite.
   (1) A supply of sediment control materials (*e.g.*, silt fence, straw bales[3]).
   (2) An oil absorbing floating boom whenever surface water is present.

iv. Vehicle staging. Vehicles must be fueled, operated, maintained and stored as follows.
   (1) Vehicle staging, cleaning, maintenance, refueling, and fuel storage must take place in a vehicle staging area placed 300-feet or more from any stream, water body or wetland.
   (2) All vehicles operated within 300-feet of any stream, water body or wetland must be inspected daily for fluid leaks before leaving the vehicle staging area. Any leaks detected must be repaired in the vehicle staging area before the vehicle resumes operation. Inspections must be documented in a record that is available for review on request by the BPA or NOAA Fisheries.
   (3) All equipment operated instream must be cleaned before beginning operations below the bankfull elevation to remove all external oil, grease, dirt, and mud.
   (4) Excavators will have properly guarded belly pan for pioneering type of work in rough terrain.

v. Stationary power equipment. Stationary power equipment (e.g., generators, cranes) operated within 150-feet of any stream, water body or wetland must be diapered to prevent leaks, unless otherwise approved in writing by NOAA Fisheries.

3. To implement reasonable and prudent measure #3 (riparian areas), the BPA shall ensure that:
   a) Heavy Equipment. Use of heavy equipment will be restricted as follows.
      i. Choice of equipment. When heavy equipment must be used, the equipment selected must have the least adverse effects on the environment (*e.g.*, minimally sized, rubber tired).
   b) Site preparation. Native materials will be conserved for site restoration.

[3] When available, certified weed-free straw or hay bales must be used to prevent introduction of noxious weeds.

i. If possible, native materials must be left where they are found.
ii. Materials that are moved, damaged or destroyed must be replaced with a functional equivalent during site restoration.
iii. Any large wood[4], native vegetation, weed-free topsoil, and native channel material displaced by construction must be stockpiled for use during site restoration.

c) Riparian disturbance. Construction activities will be conducted in a way which minimizes disturbance of riparian vegetation. In all areas that require removal of riparian vegetation, reseeding or replanting of native vegetation will occur.
i. Earthwork. Earthwork will be completed as quickly as possible.
i. Site stabilization. All disturbed areas must be stabilized, including obliteration of temporary roads or travel paths, within 12 hours of any break in work unless construction will resume work within 7 days.
ii. Source of materials. Boulders, rock, woody materials and other natural construction materials used for the project must be obtained outside the riparian area, except where noted in this Opinion.

d) Temporary access roads.
i. Existing ways. Existing roadways or travel paths must be used whenever possible, unless construction of a new way would result in less habitat take.
ii. Steep slopes. Temporary roads built mid-slope or on slopes steeper than 30% are not authorized.
iii. Minimizing soil disturbance and compaction. When a new temporary road or travel path is necessary within 150-feet[5] of a stream, water body or wetland, soil disturbance and compaction must be minimized by clearing vegetation to ground level.

e) Site restoration. All streambanks, soils and vegetation disturbed by the project are cleaned up and restored as follows.
i. Restoration goal. The goal of site restoration is renewal of habitat access, water quality, production of habitat elements (such as large woody debris), channel conditions, flows, watershed conditions and other ecosystem processes that form and maintain productive fish habitats.

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[4] For purposes of this Opinion only, "large wood" means a tree, log, or rootwad big enough to dissipate stream energy associated with high flows, capture bedload, stabilize streambanks, influence channel characteristics, and otherwise support aquatic habitat function, given the slope and bankfull width of the stream in which the wood occurs. See, Oregon Department of Forestry and Oregon Department of Fish and Wildlife, *A Guide to Placing Large Wood in Streams*, May 1995 (www.odf.state.or.us/FP/RefLibrary/LargeWoodPlacemntGuide5-95.doc).

[5] Distances from a stream or water body are measured horizontally from, and perpendicular to, the bankfull elevation, the edge of the channel migration zone, or the edge of any associated wetland, whichever is greater. "Channel migration zone" means the area defined by the lateral extent of likely movement along a stream reach as shown by evidence of active stream channel movement over the past 100 years, e.g., alluvial fans or floodplains formed where the channel gradient decreases, the valley abruptly widens, or at the confluence of larger streams.

ii. Streambank shaping. Damaged streambanks must be restored to a natural slope, pattern and profile suitable for establishment of permanent woody vegetation.

iii. Revegetation. Areas requiring revegetation must be replanted before the first April 15 following construction with a diverse assemblage of species that are native to the project area or region, including grasses, forbs, shrubs and trees.

(1) Any riparian vegetation that is removed will be used to the extent practicable in revegetation efforts.

(2) The planted and seeded areas will be watered during the first summer to optimize plant survival.

(3) If seeding or planting in any of the riparian areas fail, additional revegetation efforts will be made to ensure the establishment of a healthy riparian plant community and reduce sediment loads to the stream.

(4) Coir erosion control fabric (or equivalent material) will be used in conjunction with seeding to reduce sedimentation releases.

iv. Road Rehabilitation. When the project is completed, all temporary access roads or travel paths must have soil stabilized, and the site must be revegetated. Temporary roads or travel paths in wet or flooded areas must be abandoned and restored as necessary by the end of the in-water work period.

v. Pesticides. No pesticide application is allowed, although mechanical or other methods may be used to control weeds and unwanted vegetation.

vi. Fertilizer. No surface application of fertilizer may occur within 50-feet of any stream channel.

vii. Existing easement. The landowner's existing easement must be followed to prevent access to revegetated sites by livestock or other domestic grazing animals.

4. To implement reasonable and prudent measure #4 (electroshocking), the BPA shall ensure that:

a. Electrofishing. The fish survey operation is conducted by qualified CTUIR personnel familiar with NOAA Fisheries electrofishing guidelines (Appendix A). The survey will be conducted in accordance with permit guidelines.

b. Equipment. During electrofishing, backpack electroshockers that meet NOAA Fisheries guidelines for use on ESA listed fish will be used and the number of passes through the stretch will be kept to a minimum.

c. Temperature. No electrofishing shall be conducted when water temperatures exceed 18º C. During periods of high water temperature, sampling shall occur early in the morning or in the evening before dark.

d. Observations. Surveyors shall observe the condition of sampled fish. If fish appear stressed or injured (dark bands, gulping air, excessive mucus, irregular

swimming, or bucket predation), immediately halt sampling and decrease the frequency and voltage.

e. Fin clipping. There shall be no fin clipping on ESA listed salmonids.

f. Release. Fish will not be returned to channel sections with high turbidity resulting from construction activities.

5. To implement reasonable and prudent measures #5 (monitoring and reporting), the BPA shall ensure that:

a. Reporting. Within one year of completing the project, the BPA will submit a monitoring report to NOAA Fisheries describing the BPA's success in meeting these terms and conditions. This report will consist of the following information:

(1) Project identification

i. Permittee name, permit number, and project name.

ii. Project location, including any compensatory mitigation site(s), by 5th field HUC and by latitude and longitude as determined from the appropriate USGS 7-minute quadrangle map

iii. BPA/CTUIR contact person.

iv. Starting and ending dates for work completed

(2) Narrative assessment. A narrative assessment of the project's effects on natural stream function.

(3) Photo documentation. Photo of habitat conditions at the project and any compensation site(s), before, during, and after project completion.[6]

i. Include general views and close-ups showing details of the project and project area, including pre and post construction.

ii. Label each photo with date, time, project name, photographer's name, and a comment about the subject.

(4) Other data. Additional project-specific data, as appropriate for individual projects.

i. Work cessation. Dates work cessation was required due to high flows.

ii. Site restoration.

(a) Finished grade slopes and elevations.

(b) Log and rock structure elevations, orientation, and anchoring (if any).

(c) Planting composition and density.

(d) A five-year plan to:

1. Inspect and, if necessary, replace failed plantings to achieve 100% survival at the end of the first year, and 80% survival or 80% coverage after five years (including both plantings and natural recruitment).

[6] Relevant habitat conditions may include characteristics of channels, eroding and stable streambanks in the project area, riparian vegetation, water quality, flows at base, bankfull and over-bankfull stages, and other visually discernable environmental conditions at the project area, and upstream and downstream of the project.

2. Control invasive non-native vegetation.
3. Protect plantings from wildlife damage and other harm.

iii. Effectiveness monitoring. Gather any other data or analyses the BPA deems necessary or helpful to complete an assessment of habitat trends in stream and riparian conditions as a result of BPA actions. The BPA may use existing monitoring efforts for this purpose if those efforts can provide information specific to the objective of identifying habitat trends.

iv. Lethal take. If a dead, injured, or sick endangered or threatened species specimen is located, initial notification must be made to the NOAA Fisheries Law Enforcement Office, located at Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661; telephone: 360/418-4246. Care should be taken in handling sick or injured specimens to ensure effective treatment and care or the handling of dead specimens to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered and threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

v. Reporting. Monitoring reports will be submitted to:

NOAA Fisheries
Oregon Habitat Branch
Attn: 2002/00404
525 NE Oregon Street, Suite 500
Portland, Oregon 97232-2778

6. To ensure that these terms and conditions are met, BPA or its representative personnel will be on-site for all construction activities.

3. MAGNUSON-STEVENS ACT

3.1 Background

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance essential fish habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the MSA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).
- NOAA Fisheries must provide conservation recommendations for any federal or State action that would adversely affect EFH (§305(b)(4)(A)).
- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem, and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 C.F.R. 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 C.F.R. 600.810).

EFH consultation with NOAA Fisheries is required regarding any federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for federally-managed fisheries within the waters of Washington, Oregon, and California. Designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain

impassable artificial barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California north of Point Conception to the Canadian border (PFMC 1999).

Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1998a), coastal pelagic species (PFMC 1998b), and Pacific salmon (PFMC 1999). Casillas *et al*. (1998) provides additional detail on the groundfish EFH habitat complexes. Assessment of the potential adverse effects to these species' EFH from the proposed action is based, in part, on these descriptions and on information provided by the BPA.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of the ESA portion of this Opinion. The action area includes the Hartman's Riparian Restoration Project in the Umatilla River on Tom Hartman's property and adjacent stream and riparian areas. This area has been designated as EFH for various life stages of chinook salmon.

3.4 Effects of Proposed Action

As described in detail in the ESA portion of this consultation, the proposed activities may result in detrimental, short-term, adverse effects to a variety of habitat parameters.

3.5 Conclusion

NOAA Fisheries believes that the proposed action may adversely affect the EFH for chinook salmon.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the Magnuson-Stevens Act, NOAA Fisheries is required to provide EFH conservation recommendations for any federal or state agency action that would adversely affect EFH. In addition to conservation measures proposed for the project by the BPA/CTUIR, all of the Reasonable and Prudent Measures and the Terms and Conditions contained in section 2.4 of the ESA portion of this Opinion are applicable to salmon EFH. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

3.7 Statutory Response Requirement

Please note that the Magnuson-Stevens Act (section 305(b)) and 50 CFR 600.920(j) requires the

BPA/CTUIR to provide a written response to NOAA Fisheries' EFH conservation recommendations within 30 days of its receipt of this letter. The response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity on EFH. If the response is inconsistent with NOAA Fisheries' conservation recommendations, the reasons for not implementing the BPA shall explain its reasons for not following the recommendations.

3.8 Supplemental Consultation

The BPA/CTUIR must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

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Appendix A-NMFS Electrofishing Guidelines (NMFS 2000)

ELECTROFISHING GUIDELINES

Suggested protocol for the use of backpack electrofishing equipment in waters containing fish listed under the Endangered Species Act (ESA). These recommendations should be seen as guidelines for developing consistent and safe electrofishing technique. It is hoped that these guidelines will ultimately help improve electrofishing technique in ways which will reduce fish injury and increase electrofishing efficiency.

Purpose and Scope
The purpose of this document is to recommend guidelines for using backpack electrofishing equipment to sample ESA-listed fish. Because electrofishing can kill or severely injure fish, every effort should be made to avoid electrofishing and use snorkeling or other fishery information collection techniques. Where electrofishing is the only suitable sampling method, these guidelines are suggested to help reduce the number of fish killed or severely injured. These guidelines are concerned only with studies that involve electrofishing juvenile or adult salmonids that are *not* in spawning condition. Electrofishing in the vicinity of adults in spawning condition or operating equipment in the vicinity of redds containing developing eggs is not discussed as there is no justifiable basis for permitting these activities near listed species. Also, these guidelines do not deal with factors such as temperature or fish handling technique both of which can significantly affect fish health during an electrofishing session. None the less, all ESA-listed fish must be sampled with extreme care. The field crew must carefully design the sampling sessions to minimize fish stress by working within favorable temperature regimes, using anesthetics when necessary, and minimizing the time the fish are held before release. As with all fieldwork involving live ESA-listed fish, the best science should be used along with an experienced crew and good equipment in order to minimize handling stress.

Equipment
Equipment should be in good working condition. Operators should go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a log.

Training
A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment should train the crew. The crew leader’s experience must be documented and available for confirmation; such documentation may be in the form of a logbook. The training should occur before an inexperienced crew begins any electrofishing; it should also be conducted in waters that do not contain ESA-listed fish.

The training program must include the following elements:

1. Definitions of basic terminology: e.g. galvanotaxis, narcosis, and tetany.

2. An explanation of how electrofishing attracts fish.

3. An explanation of how gear can injure fish and how to recognize signs of injury.

4. A review of these guidelines and the manufacturer's recommendations.

5. A demonstration of the proper use of electrofishing equipment, the role each crew member performs, and basic gear maintenance.

6. A field session where new individuals actually perform each role on the electrofishing crew.

Specific Electrofishing Guidelines

1. In order to avoid contact with spawning adults or active redds, carefully survey the area to be sampled before beginning electrofishing.

2. Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

3. Only direct current (DC) should be used.

4. Each session should begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500 us and do not exceed 5 milliseconds. Pulse rate should start at 30Hz and work carefully upwards. *In general*, exceeding 40 Hz will injure more fish.

5. The zone of potential fish injury is 0.5m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

6. The stream segment should be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

7. Crew should carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling should be terminated if injuries occur or abnormally long recovery times persist.

8. When the sampling design involves taking scales and measurements, a healthy environment for the stressed fish must be provided and the holding time must be minimized. For these operations, additional crew members who are experienced in holding and processing stressed fish may be necessary.

9. Whenever possible, a block net should be placed below the area being sampled to capture stunned fish that may drift downstream.

10. The electrofishing settings should be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, together with observations on fish condition, will improve technique and form the basis for training new operators.